[0032] In an embodiment, the determined time period is equal to the shortest of the plurality of discovery frame broadcast periodicities.

[0033] The embodiment of FIG. **2** may employ in the initial channel assessment an estimate of channel utilization as a criterion for the selection of the network discovery method, e.g. the passive scanning or the active scanning. Upon detecting a transmission, the apparatus may determine that the channel is densely utilized and choose the first network discovery method employing the passive scanning only. Accordingly, the apparatus will not congest the channel with unnecessary scanning requests in a situation where the channel is densely utilized. Additionally, the apparatus may reduce power consumption by preventing unnecessary active scanning. Upon detecting no transmissions, the apparatus may determine that the channel is not utilized densely and select the network discovery method employing the second network discovery method employing active scanning or, in another embodiment, select a network discovery method enabling both active and passive scanning functions. Accordingly, the apparatus may speed up discovery of a network in a situation where the channel is not utilized densely by enabling the active scanning.

[0034] In another embodiment, both network discovery methods may employ both active scanning and the passive scanning but the first network discovery method may specify different rules for the active scanning than the second network discovery method. The result of the rules may be that the apparatus employing the first network discovery method transmits the scanning messages less often than the apparatus employing the second network discovery method. The first network discovery method may specify, for example, restrictions to the transmission timing of the scanning request messages, while the second network discovery method specifies no such restrictions.

[0035] As described above, the terminal device may be configured to search for access nodes that transmit discovery frames with a higher periodicity (higher frequency), e.g. with 20 ms periodicity, and access nodes that transmit the discovery frames with a lower periodicity (lower frequency), e.g. 100 ms periodicity. Accordingly, the duration of the initial channel assessment may be shorter than the periodicity of said higher periodicity.

[0036] In an embodiment, the apparatus has performed the initial channel assessment before the execution of the procedure of FIG. **2**. The initial channel assessment may have been made as a part of conventional channel access by the apparatus. Any time the apparatus performs channel scanning in an attempt to access the channel for frame transmissions or in an attempt to detect transmissions by other apparatuses, the apparatus may store a record of a detected frame transmission or, in general, a record of detected transmission on the channel. The apparatus may store in the record an identifier of the channel and at least one of the following information: the location where the discovery was performed such as satellite positioning coordinates or an identifier of a cell of a cellular communication system; information on the channel obtained from at least one other channel; an identifier of a discovered access node or a wireless network and capability of the access node or the wireless network to support only the passive scanning; a value indicating the amount of traffic on the channel; a time label indicating the timing of the latest update of the record. In another embodiment where no such initial channel assessment has been made or that information achieved in the initial channel assessment is determined to be outdated, the apparatus may initiate the initial channel assessment.

[0037] In an embodiment, the apparatus employs a timer to define the duration of the initial channel assessment. FIG. **3** illustrates a flow diagram of such an embodiment of FIG. **2**. Referring to FIG. **3**, the apparatus starts the initial channel assessment in block **300**. At the same time, the apparatus may start a timer counting a time period allocated to the initial channel assessment.

[0038] In an embodiment, the time period counted by the timer is shorter than or equal to a discovery frame broadcast interval of an access node supporting the passive scanning only, e.g. an OCE-capable access node. The time period may be shorter than or equal to 20 milliseconds (ms) which is the periodicity of the FILS discovery frames. The time period may be shorter than or equal to 10 ms. The time period may be shorter than or equal to 5 ms.

[0039] During the initial channel assessment, the apparatus may scan for radio energy on the radio channel (block **302**). The radio channel may be a 2.4 GHz channel the apparatus knows to be used by OCE-capable access nodes, or it may be another channel the apparatus knows to be a potential operating channel of an access node to which the apparatus may associate. The apparatus may gain information on the potential operating channels from previous network discovery attempts, from information received from a cellular communication network through an access network discovery and selection function (ANDSF) specified within 3GPP (3^{rd} Generation Partnership Project). Block **302** may comprise or consist of physical carrier sensing. Upon detecting a transmission or radio energy on the channel in block **202**, the process may proceed to block **204** in the above-described manner. The timer may in this case be stopped upon detecting the radio energy. However, upon detecting no radio energy, the process may proceed to block **304** in which the carrier sensing is performed until the timer expires. When the timer expires, the apparatus may assume that there is no dense utilization of the radio channel and select second network discovery method employing the active scanning (block **306**).

[0040] In an embodiment, upon detecting no discovery frame from an access node within a determined time interval after starting the network discovery according to the passive scanning, the apparatus may switch from the passive scanning to the active scanning. FIG. **4** illustrates an embodiment of the operation of the apparatus in a situation where the apparatus has selected the passive scanning in block **204**. Referring to FIG. **4**, the apparatus starts the passive scanning in block **400** and starts a timer counting a determined time interval.

[0041] In an embodiment, the time interval may be longer than the time period described above in connection with FIG. **3**. In an embodiment, the time interval is shorter than or equal to a discovery frame broadcast interval of an access node supporting the first network discovery method. In an embodiment, the time interval is 10 ms.

[0042] In an embodiment, the combined duration of the time period of the initial channel assessment and the time interval specifying the duration of the passive scanning after its selection is shorter than the shortest of the plurality discovery frame broadcast periodicities employed by access nodes the apparatus is configured to search for in the network discovery, e.g. shorter than the periodicity of the FILS dis-